

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

MBHB Ref. No. 01-185-A

In the Application of:)
Brent Townshend, et al.)
Serial No.: 10/087,651) Examiner: Michael N. Opsasnick
Filing Date: March 1, 2002) Group Art Unit: 2626
For: System for Measuring Intelligibility of)
Spoken Language)

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Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

APPEAL BRIEF

Dear Sir:

This Appeal Brief is submitted pursuant 37 C.F.R. § 41.37, and is filed in furtherance of the Notice of Appeal mailed June 20, 2007.

Please charge the small entity Appeal Brief fee and extension fees to Deposit Account No. 132490.

I. Real Party in Interest

The real party in interest is Ordinate Corporation, a wholly-owned subsidiary of Harcourt Assessment, Inc., which is a wholly-owned subsidiary of Harcourt, Inc., which is a wholly-owned subsidiary of Reed Elsevier, Inc. which is a wholly-owned subsidiary of Reed Elsevier plc.

II. Related Appeals and Interferences

Applicants are not aware of any related appeals, interferences, or judicial proceedings.

III. Status of Claims

Claims 1, 2, 4-24, 26, 28, 29, 32-38, and 40-45 stand rejected. Claims 3, 25, 27, 30, 31, and 39 are canceled. Claims 1, 2, 4-24, 26, 28, 29, 32-38, and 40-45 are appealed.

IV. Status of Amendments

No amendments were filed subsequent to the non-final rejection mailed March 21, 2007.

V. Summary of Claimed Subject Matter

This invention relates generally to measuring intelligibility. Independent claims 1, 11, 21, 36, and 45 recite an intelligibility measurement system, while independent claim 24 recites a method of measuring intelligibility. Claims 1, 11, 21, 24, 36, and 45 are further described below.

As recited in claim 1, the system for measuring intelligibility includes a human listener, a speaker, a preparing means, a comparing means, and a measuring means. See Applicants' Specification, page 5, lines 8 to 13; page 6, line 11 to page 7, line 15; Figs. 1 and 2. The speaker repeats items aloud, and the listener, who is without knowledge of the items prior to hearing those items from the speaker, repeats the items aloud. See Applicants' Specification, page 5, line 22 to page 6, line 7; page 6, lines 17 to 19; page 6, line 22 to page 7, line 1. The preparing means then automatically prepares a transcription of what the listener repeats, and the comparing means automatically compares the transcription to a text of the items spoken by the speaker. See

Applicants' Specification, page 7, lines 1 to 15. The measuring means is coupled to the comparing means and measures intelligibility. See Applicants' Specification, page 7, lines 8 to 15.

As recited in claim 11, the system for measuring intelligibility includes a speaker, a human listener, an automatic speech recognition transcription program, and a measurement unit. See Applicants' Specification, page 6, line 11 to page 7, line 15; Figs. 1 and 2. The speaker speaks items aloud, and the listener, who is without knowledge of the items prior to hearing those items from the speaker, repeats the items aloud. See Applicants' Specification, page 5, line 22 to page 6, line 7; page 6, lines 17 to 19; page 6, line 22 to page 7, line 1. The automatic speech recognition transcription program is operable to create a transcription of what the listener repeats, and the measurement unit is operable to determine an intelligibility score of the speaker by automatically comparing a text of the items to the transcription. See Applicants' Specification, page 7, lines 2 to 15.

As recited in claim 21, the system for measuring intelligibility includes a speaker, a human listener, an automatic speech recognition transcription program, and a measurement unit. See Applicants' Specification, page 6, line 11 to page 7, line 15; Figs. 1 and 2. The speaker speaks items aloud, and the listener, who is without knowledge of the items prior to hearing those items from the speaker, repeats the items aloud. See Applicants' Specification, page 5, line 22 to page 6, line 7; page 6, lines 17 to 19; page 6, line 22 to page 7, line 1. The automatic speech recognition transcription program is operable to create a transcription of what the listener repeats, and the measurement unit is operable to determine an intelligibility score of the speaker using the transcription and Item Response Theory and to determine an error count by automatically comparing the words with the transcription. See Applicants' Specification, page 7, line 2 to page 8, line 15.

As recited in claim 24, the method of measuring intelligibility includes:

- (i) obtaining responses from a speaker speaking items (see Applicants' Specification, page 10, lines 3 to 9);
- (ii) presenting the responses to a human listener, wherein the listener does not know a text of the items the speaker spoke prior to hearing the speaker speaking the items (see Applicants' Specification, page 6, lines 17 to 19; page 10, lines 3 to 14);
- (iii) repeating the spoken responses aloud by the listener (see Applicants' Specification, page 10, line 13);
- (iv) automatically creating a transcription of what the listener repeats (see Applicants' Specification, page 10, lines 13 to 14);
- (v) measuring accuracy by automatically comparing the text of the items with the transcription (see Applicants' Specification, page 10, lines 15 to 21); and
- (vi) determining an intelligibility score of the speaker based at least in part on the measuring step. See Applicants' Specification, page 10, line 22 to page 11, line 11.

As recited in claim 36, the system for automatically measuring intelligibility includes a speaker, a human listener, an automatic speech recognition transcription program, a database, and a nonlinear model. See Applicants' Specification, page 6, lines 11 to 21; page 11, lines 12 to 17; Fig. 5. The speaker speaks items aloud, and the listener, who is without knowledge of the items prior to hearing those items from the speaker, repeats the items aloud. See Applicants' Specification, page 5, line 22 to page 6, line 7; page 6, lines 17 to 19; page 6, line 22 to page 7, line 1. The automatic speech recognition transcription program is operable to create a transcription of the listener's repetition. See Applicants' Specification, page 7, lines 1 to 5. The database contains speaker responses, the text of the items, and transcriptions of the listener repetitions. See Applicants' Specification, page 11, lines 18 to 20. The nonlinear model is operable to provide an intelligibility

estimate of the speaker's intelligibility by automatically comparing the test of the items and the transcriptions contains in the database. See Applicants' Specification, page 11, line 20 to page 12, line 2.

As recited in claim 45, the system for measuring intelligibility includes a human listener, a speaker, an automatic speech recognition transcription program, a comparing means, and a measuring means. See Applicants' Specification, page 6, line 11 to page 7, line 15; Figs. 1 and 2. The speaker speaks items aloud, and the listener, who is without knowledge of the items prior to hearing those items from the speaker, repeats the items aloud. See Applicants' Specification, page 5, line 22 to page 6, line 7; page 6, lines 17 to 19; page 6, line 22 to page 7, line 1. The automatic speech recognition program is operable to create a transcription of what the listener repeats, and the comparing means automatically compares the transcription to a text of the items spoken by the speaker. See Applicants' Specification, page 7, lines 2 to 15. The measuring means is coupled to the comparing means and measures intelligibility. See Applicants' Specification, page 7, lines 8 to 15.

VI. Grounds of Rejection to be Reviewed on Appeal

There are two grounds of rejection set forth in the non-final office action that are to be reviewed on appeal: (1) the rejection of claims 1, 2, 4 to 8, 11 to 18, 24, 26, 28, 29, 32, 33, 36, 37, 42, 44, and 45 as being obvious (35 U.S.C. § 103) over Rtischev (U.S. Pat. No. 5,634,086) in view of Kahn (U.S. Pat. No. 6,122,614) and in further view of Baker (U.S. Pat. No. 4,783,803); and (2) the rejection of claims 9, 10, 19, 20 to 23, 34, 35, 38, 40, 41, and 43 as being obvious (35 U.S.C. § 103) over Rtischev, Kahn, and Baker in further view of Lewis (U.S. Pat. No. 5,059,127).

VII. Argument

1. Summary

All of the rejections are improper and should be reversed because the prior art does not teach or suggest: (i) a listener who hears a speaker speaking items and then repeats aloud what is heard; (ii) automatically preparing a transcription of what the listener repeats aloud; (iii) automatically comparing the transcription of what the listener repeated aloud with a text of the items spoken by the speaker; or (iv) measuring intelligibility. As discussed in more detail below, the references upon which the Examiner relies are generally concerned with increasing accuracy in speech recognition systems; thus, the systems described are more likely to mask a deficiency in a speaker's intelligibility rather than to provide a measurement of a speaker's intelligibility.

2. Legal Standards

35 U.S.C. § 103 provides that a patent may not be obtained "if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains." Under *Graham v. John Deere & Co.*, 383 U.S. 1 (1966), the relevant inquiries are the scope and content of the prior art, the level of skill in the art, the differences between the prior art and the claims, and any secondary considerations, such as satisfaction of long felt need, failure of others, or commercial success.

The Examiner bears the burden of establishing a *prima facie* case of obviousness. *In re Fritsch*, 972 F.2d 1260, 1265 (Fed. Cir. 1992). In order to establish a *prima facie* case of obviousness over a combination of references, the combination must teach or suggest all of the claim limitations. M.P.E.P. § 2143.03; *In re Royka*, 490 F.2d 981 (CCPA 1974).

The Supreme Court recently reaffirmed the obviousness analysis as set forth in *Graham*. *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1739 (2007). The Court of Appeals for the Federal Circuit had previously opined that, "[o]bviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion to support the combination." *ACS Hosp. Sys., Inc. v. Motefiore Hosp.*, 732 F.2d 1572, 1577 (Fed. Cir. 1984). In *KSR*, the Supreme Court held that this teaching, suggestion, or motivation test devised by the Federal Circuit, while not necessarily inconsistent with *Graham*, is not appropriate as a rigid rule for determining what is obvious. *KSR*, 127 S. Ct. at 1741. However, the Court also stated that, "a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art . . . it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does." *Id.*

In light of the Supreme Court's recent decision shaping the obviousness inquiry, the Examiner's obviousness rejections of all pending claims are legally deficient for at least two reasons. Most importantly, the references cited by the Examiner fall short of establishing a *prima facie* case of obviousness for failure to disclose all elements of the independent claims. However, even assuming *arguendo* that the claim elements somehow appear in the references, the rejections are also legally deficient because the Examiner has provided no justification for the fact or the configuration of the combination of references upon which he relies.

3. The Examiner Erred in Rejecting Claims 1, 2, 4 to 8, 11 to 18, 24, 26, 28, 29, 32, 33, 36, 37, 42, 44, and 45 as Being Obvious over a Combination of Rtischev, Kahn, and Baker

Applicants recite a system (independent claims 1, 11, 21, 36, and 45) and a method (independent claim 24) for measuring intelligibility of a speaker. Intelligibility is the degree to which

others can understand a person's speech. Applicants' Specification, page 2, lines 12-13. An objective score of a person's intelligibility may be important in many situations, such as when hiring customer service representatives, teachers, and emergency response coordinators. Applicants' Specification, page 3, lines 7 to 12. Because the intelligibility of a speaker is based on a listener's perception of the speaker's speech, both the speaker and the listener (i.e., at least two people) are used to evaluate intelligibility. It is important to note that a human understanding speech and a computer understanding speech are different problems requiring different solutions; a human understanding speech is termed "intelligibility" and is the focus of the present invention, and a computer understanding speech is termed "speech recognition" and is the focus of much of the cited art.

In claims 1, 11, 21, 24, 36, and 45, Applicants recite an intelligibility measuring system or method. The person whose intelligibility is being evaluated (the speaker) speaks items, such as a list of words, sentences, paragraphs, and so on. The listener hears the speaker who is speaking the items. The listener does not know what items the speaker will speak prior to hearing the speaker speaking the items. The listener then repeats out loud what he hears when listening to the speaker. A transcription of what the listener repeats is automatically created, for example by using an automatic speech recognition transcription program. The transcription is then compared to a text of the items to produce an intelligibility score for the speaker. Because neither the listener nor another person manually prepares (e.g., types out) a transcription, the intelligibility system can provide a large number of intelligibility scores in a short period of time.

Neither Rtischev, nor Kahn, nor Baker teach or suggest: (i) a listener who hears a speaker speaking items and then repeats aloud what is heard; (ii) automatically preparing a transcription of what the listener repeats aloud; (iii) comparing the transcription of what the listener repeated aloud

with a text of the items spoken by the speaker; or (iv) measuring intelligibility as recited in claims 1, 2, 4-24, 26, 28, 29, 32-38, and 40-45. Accordingly, the rejection should be reversed.

Rtischev

Rtischev discloses a method and apparatus for voice-interactive language instruction.

Rtischev, Title. "A system can administer a lesson, and particularly a language lesson, and evaluate performance in a natural interactive manner while tolerating strong foreign accents, and produce as an output a reading quality score." Rtischev, Abstract. The user of the system uses a microphone or telephone to respond to lesson materials. See, e.g., Rtischev, Figure 2. The user's responses are detected by a speech recognition system and a scoring system analyzes the speech and reading proficiency. See, e.g., Rtischev, column 3, lines 10 to 65.

As acknowledged by the Examiner, Rtischev does not disclose a human listener who hears the user. See Office Action mailed March 21, 2007, page 2 ("Rtischev *et al.* does not explicitly teach a human listener preparing the transcription without prior knowledge of the text that is being spoken."). The user in Rtischev speaks directly into a system via the microphone or telephone. Rtischev, column 4, lines 45 to 53. A second human is not placed between the user and the system to repeat what the user says to the system, nor is there any suggestion to add a second human who would repeat the user's responses.

Rtischev does discuss a speaker's repetition of words. See, e.g., Rtischev, column 6, lines 12 to 53. However, the repetition of the speaker disclosed in Rtischev differs distinctly from the presently claimed human listener repeating the spoken items of a speaker. In Rtischev, the repetition occurs after a prompt by the speech recognition system that a previous utterance was somehow unsatisfactory. Rtischev, column 6, lines 18 to 21. If the speaker in Rtischev were to repeat the previous utterance as it was originally stated, the new utterance would likely draw the same repetition

prompt once again from the speech recognition system. Rtischev, column 6, lines 25 to 43.

However, in the present claims, the human listener repeats what he or she hears, not some intentional improvement or variation on what is heard. Basically, in Rtischev what is misunderstood by the system is repeated by the original speaker, whereas in the present claims, what is understood by a human listener is repeated by that listener and not by the original speaker.

Moreover, Rtischev does not show or suggest preparing a transcription, never mind a transcription of what the listener repeats. There is no suggestion within Rtischev to prepare a transcription as this activity would at worst impede, and at best have no effect on, the interactive nature of the language instruction system. As there is no teaching for preparing a transcription, there can be no teaching in Rtischev to compare a text of the spoken items with the transcription.

Far from disclosing a system that measures different intelligibilities, Rtischev endeavors to create a speech recognition system that is tolerant of a wide range of user intelligibility. Rtischev teaches the processing of scripts with script readings in two modes to produce a system “able to recognize and respond accurately and in a natural manner to scripted speech, **despite** poor user pronunciation, pauses, and other disfluencies.” Rtischev, column 3, lines 18 to 21 (emphasis added).

In training mode, the system in Rtischev “builds a network of speech models specifically for the preselected script,” where the preselected script is a functional subset of a training script, and in reading mode, “[t]he speech of the trainee/user 116 is presumed to be in the form a speech pattern 118 corresponding to [some subset of the training script].” Rtischev, column 5, lines 43 to 44 and lines 46 to 53. This linkage between what is read and what is recognized at the level of the speech recognition system militates away from the present invention, where objective intelligibility is measured through the participation of a speaker and a listener who listens to speech *without prior knowledge of what is spoken*.

Thus, Rtischev fails to show or suggest at least: (i) a listener who hears a speaker speaking items and then repeats aloud what is heard; (ii) automatically preparing a transcription of what the listener repeats aloud; (iii) comparing the transcription of what the listener repeated aloud with a text of the items spoken by the speaker; or (iv) measuring intelligibility.

Kahn

Kahn falls short of overcoming the deficiencies of Rtischev. Kahn discloses a system and method for automating transcription services. Kahn, Title. The system receives a voice dictation file from a user (i.e., a speaker) who has a status of “enrollment,” “training,” “automated,” or “stop automated.” Kahn, Abstract. If the user’s status is either enrollment or training, a human operator (i.e., a listener) manually transcribes the voice dictation file. See, e.g., Kahn, Figs. 2b and 2c. If the user’s status is enrollment, a human operator also manually creates a verbatim file. See, e.g., Kahn, Fig. 2b. If the user’s status is training, the speech recognition system is used to generate a written text, which the human operator manually edits to create the verbatim file. See, e.g., Kahn, Fig. 2c. The verbatim file is then used to train the speech recognition system. See, e.g., Kahn, Figs. 2b and 2c. If the user’s status is automated, the voice dictation file is automatically converted to a written file without the use of a human operator. Kahn, column 10, lines 48 to 57.

While Kahn describes a human operator who hears the voice dictation file prepared by the user, there is no reason, much less any suggestion, for the human operator to repeat aloud what he hears on the voice dictation file. Thus, Kahn does not show or suggest the human operator repeating aloud what he heard when hearing the user on the voice dictation file. Moreover, the transcription that the human operator or the speech recognition system prepares is a transcription of the user’s speech, not a transcription of the human operator’s speech. Indeed, to the extent that the transcription may originally reflect the human operator’s understanding of the user’s speech, rather

than the speech itself, the subsequent creation of a verbatim text for use in training the speech recognition serves to erase discrepancies between what the user speaks and what the operator hears, and such discrepancies define intelligibility. Thus, Kahn also does not show or suggest automatically preparing a transcription of what the human operator repeats aloud.

Furthermore, Kahn does not show or suggest comparing the transcription with a text of the spoken items. The human operator or the speech recognition system receives a voice dictation file, which is an audio file created by the user by speaking into a recording device. Neither the human operator nor the speech recognition system receives a text of what the user was reading from, because no such text exists. The user would not need a transcription if he already had a hard copy of what he read into the recorder. Thus, the transcription prepared by either the human operator or the speech recognition system is never compared with the text of items repeated by the speaker.

Additionally, Kahn fails to show or suggest measuring intelligibility. An object of the invention of Kahn is to minimize the number human operators needed to transcribe audio files. Kahn, column 1, lines 41 to 45. Thus, Kahn teaches the minimization, or even elimination, of the role of the human listener, the listener who is a necessary component of Applicants' claimed invention for measuring intelligibility. Moreover, Kahn does not describe providing any feedback regarding any ability of the user. Similar to Rtischev, Kahn tailors speech recognition to particular speakers, such that the intelligibility of these speakers has diminished or has no effect on the accuracy of the speech recognition. Accordingly, Kahn fails to show or suggest measuring intelligibility.

Thus, Kahn fails to show or suggest at least: (i) a listener who hears a speaker speaking items and then repeats aloud what is heard; (ii) automatically preparing a transcription of what the listener repeats aloud; (iii) comparing the transcription of what the listener repeated aloud with a text of the items spoken by the speaker; or (iv) measuring intelligibility. Additionally, there is no reason

that a person of ordinary skill in the art would have combined Rtischev and Kahn to measure intelligibility, further undermining the rejection of the present claims. Beyond implying that Rtischev and Kahn are both somehow connected to “the art of speech transcription,” the Examiner fails to provide any justification for combining the teachings of Kahn with those of Rtischev. Office Action mailed March 21, 2007, page 2.

Baker

Baker falls short of overcoming the deficiencies of Rtischev and Kahn. Baker is concerned with an improvement to speech recognition systems. Baker, column 5, lines 38 to 41. Baker’s system allows a user of a speech recognition system to confirm the system’s best guess of a spoken word by the user speaking another word. Baker, Abstract. This improves “the ease with which a user can confirm [the system’s] output when the speech recognition is correct and can modify that output when its recognition is in error.” Baker, column 41, lines 39 to 44. However, Baker is silent with respect to a second human (i.e., a listener), transcriptions, comparing items with a transcription, and intelligibility.

Baker does not disclose a human listener who hears the user. The Examiner asserted that “the issue of the operator speaking the perceived translation has been addressed by the introduction of the Baker et al reference.” Office Action mailed on June 9, 2005, page 6. The Examiner provides support for this conclusion by stating that Baker “teaches a microphonic input for a **user** to input speech for recognition . . . wherein the output is in a word text format and is allowed to be edited by the **user**.” Office Action mailed on March 21, 2007, page 3 (emphasis added). However, as clearly described in the Examiner’s argument, only one human is involved—the user.

Further, Baker does not suggest the addition of a human listener. In Baker, as in Rtischev, the user speaks directly into the system via a microphone. See, e.g., Baker, column 13, lines 49 to

66. A second human is not placed between the user and the system to repeat what the user says to the system, and the addition of a second human to repeat the user's responses would only hinder Baker's purpose of facilitating the correction of the output of a speech recognition system by the user of the system. See, e.g., Baker, column 41, lines 40 to 45. Indeed, though Baker includes extensive discussion of the interaction between a speaker and a speech recognition system, Baker explicitly teaches away from a human listener participating in the system:

The [mu] and [sigma] for each parameter of each node in a word model can be derived by statistical techniques. For example a plurality of utterances of a given word can be divided into a plurality of nodes by a **human listener** playing back a recording of each word at a slow pace. Then the value of [mu] and [sigma] can be calculated for each node by standard statistical techniques. Although this method yields good results, it is **very time consuming. Fortunately, more efficient automatic method** (sic) of deriving node models has been developed in the prior art.

Baker, column 16, lines 58 to 68 (emphasis added).

Baker also does not show or suggest automatically preparing a transcription of what the listener repeats or automatically comparing the transcription with the text of the spoken items. Baker discusses the user manipulating a text file of what the speech recognition system recognizes to "enable the operator to type in words the system didn't understand, as well as edit words the system did understand once such words have been dictated." Baker, column 45, line 54 to column 46, line 4. Even assuming the user in Baker corresponds to the listener in the present claims, the text output manipulated by the user is not an automatic (i.e., machine-based) transcription of what the user-listener repeated aloud, and there is no original text of spoken items to which the manipulated text output could be automatically compared. Indeed, Baker discloses no functional unit equipped to carry out such an automatic comparison of a transcription to a text.

Moreover, Baker does not teach an intelligibility measurement. Like Rtishev and Kahn, Baker is directed to improving a speech recognition system. By allowing the speaker to edit and

train the speech recognition system, Baker discloses a system that minimizes the effect that a speaker's intelligibility has on the output from the speech recognition system. Additionally, Baker is silent with respect to any intelligibility score that the speech recognition system could provide to a user.

Like both Rtischev and Kahn, Baker does not show or suggest: (i) a listener who hears a speaker speaking items and then repeats aloud what is heard; (ii) automatically preparing a transcription of what the listener repeats aloud; (iii) comparing the transcription of what the listener repeated aloud with a text of the items spoken by the speaker; or (iv) measuring intelligibility. Thus, any combination of these references also fails to show or suggest these claim elements.

Additionally, there is no reason that a person of ordinary skill in the art would have combined Rtischev, Kahn, and Baker to measure intelligibility, further undermining the rejection of the present claims based on that combination of references. Beyond implying that Rtischev, Kahn, and Baker are all somehow connected to "the art of speech recognition," the Examiner fails to provide any justification for combining the teachings of Baker with those of Kahn and Rtischev. Office Action mailed March 21, 2007, page 3.

Conclusion

Because the combination of Rtischev, Kahn, and Baker fails to show or suggest each and every element of independent claims 1, 11, 21, 24, 36, and 45, these claims are not obvious in light of the combination of Rtischev, Kahn, and Baker. Therefore, Applicants respectfully request that the rejection of independent claims 1, 11, 21, 24, 36, and 45 be withdrawn and that those claims be placed in condition for allowance. Furthermore, for the reason that dependent claims 2, 4 to 8, 12 to 18, 26, 28, 29, 32, 33, 37, 42, and 44 depend from allowable independent claims, Applicants assert that those dependent claims should also be placed in condition for allowance.

4. The Examiner Erred in Rejecting Claims 9, 10, 19, 20 to 23, 34, 35, 38, 40, 41, and 43 as Being Obvious over a Combination of Rtishev, Kahn, Baker, and Lewis

Like Rtishev, Kahn, and Baker, Lewis fails to show or suggest: (i) a listener who hears a speaker speaking items and then repeats aloud what is heard; (ii) automatically preparing a transcription of what the listener repeats aloud; (iii) comparing the transcription of what the listener repeated aloud with a text of the items spoken by the speaker; or (iv) measuring intelligibility. Lewis is directed to a “Computerized Mastery Testing System, [and] a Computerized Administered Variable Length Sequential Testing System for Making Pass/Fail Decisions.” Lewis, Title. The Examiner cited to Lewis for discussions of evaluating difficulty of items, the ability of a listener, using Item Response Theory, and a database containing data from previous evaluations. Office Action mailed March 31, 2007, pages 4 to 5. However, these citations to Lewis fail to overcome the deficiencies of Rtishev, Kahn, and Baker, and the Examiner further fails to give any justification for combining Lewis with any or all of the other references. For at least the foregoing reason, Applicants assert that the addition of Lewis to the combination of Rtishev, Kahn, and Baker in no way undermines the allowability of independent claims 1, 11, 21, 24, 36, and 45. Therefore, because dependent claims 9, 10, 19, 20 to 23, 34, 35, 38, 40 and 41 depend from allowable independent claims, Applicants submit that those dependent claims should also be placed in condition for allowance.

VIII. Conclusion

Applicants have demonstrated that the rejections are in error as a matter of law. Applicants therefore request reversal of the rejections and allowance of all pending claims in this application.

Respectfully submitted,

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Date: August 13, 2007

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CLAIMS APPENDIX

1. (previously presented) An intelligibility measurement system, comprising in combination:
 - a human listener that hears a speaker who is repeating items and repeats aloud what is heard, wherein the listener does not know a text of the items the speaker repeated prior to hearing the speaker repeating the items;
 - a means for automatically preparing a transcription of what the listener repeats;
 - a means for automatically comparing the text of the items with the transcription; and
 - a means for measuring intelligibility coupled to the comparing means.
2. (original) The system of Claim 1, wherein the speaker is at least one person whose intelligibility is to be measured.
3. (canceled)
4. (previously presented) The system of Claim 1, wherein the listener is a plurality of people capable of listening.
5. (original) The system of Claim 1, wherein the items are words.
6. (previously presented) The system of Claim 1, wherein the transcription is a written copy of what the listener heard when the speaker repeated the items.

7. (original) The system of Claim 1, wherein an error count is determined by comparing the items with the transcription.
8. (original) The system of Claim 7, wherein the error count is determined by evaluating factors selected from the group consisting of word insertions, word deletions, and word substitutions.
9. (original) The system of Claim 1, wherein an intelligibility score is determined by evaluating factors selected from the group consisting of error count, difficulty of the items, and ability of a listener.
10. (original) The system of Claim 1, wherein Item Response Theory is used to determine an intelligibility score.
11. (previously presented) An intelligibility measurement system, comprising in combination:
 - a speaker that speaks items;
 - a human listener that hears the speaker speaking the items and repeats aloud what is heard, wherein the listener does not know a text of the items the speaker spoke prior to hearing the speaker speaking the items;
 - an automatic speech recognition transcription program operable to create a transcription of what the listener repeats; and
 - a measurement unit operable to determine an intelligibility score of the speaker by automatically comparing the text of the items to the transcription.

12. (original) The system of Claim 11, wherein the speaker is at least one person whose intelligibility is to be measured.

13. (original) The system of Claim 11, wherein the listener is a plurality of people capable of listening.

14. (original) The system of Claim 11, wherein the listener is selected based on certain background characteristics.

15. (previously presented) The system of Claim 11, wherein the transcription is a written copy of what the listener heard when the speaker spoke the items.

16. (original) The system of Claim 11, wherein the items are words.

17. (original) The system of Claim 11, wherein an error count is determined by comparing the items with the transcription.

18. (original) The system of Claim 17, wherein the error count is determined by evaluating factors selected from the group consisting of word insertions, word deletions, and word substitutions.

19. (original) The system of Claim 11, wherein the intelligibility score is determined by evaluating factors selected from the group consisting of error count, difficulty of the items, and ability of the listener.

20. (original) The system of Claim 11, wherein the measurement unit uses Item Response Theory to determine the intelligibility score.

21. (previously presented) An intelligibility measurement system, comprising in combination:

- a speaker whose intelligibility is to be measured;
- a human listener that hears the speaker speak words and repeats aloud what is heard, wherein the listener does not know what words the speaker spoke prior to hearing the speaker speaking the words;
- an automatic speech recognition transcription program operable to create a transcription of what the listener repeats; and
- a measurement unit operable to determine an intelligibility score of the speaker using the transcription, wherein an error count is determined by automatically comparing the words with the transcription, and wherein the measurement unit uses Item Response Theory to determine the intelligibility score.

22. (original) The system of Claim 21, wherein the error count is determined by evaluating factors selected from the group consisting of word insertions, word deletions, and word substitutions.

23. (original) The system of Claim 21, wherein the intelligibility score is determined by evaluating factors selected from the group consisting of error count, difficulty of the items, and ability of the listener.

24. (previously presented) A method of measuring intelligibility, comprising in combination: obtaining responses from a speaker speaking items; presenting the responses to a human listener, wherein the listener does not know a text of the items the speaker spoke prior to hearing the speaker speaking the items; repeating the spoken responses aloud by the listener; automatically creating a transcription of what the listener repeats; measuring accuracy by automatically comparing the text of the items with the transcription; and determining an intelligibility score of the speaker based at least in part on the measuring step.

25. (canceled)

26. (original) The method of Claim 24, wherein the speaker is at least one person whose intelligibility is to be measured.

27. (canceled)

28. (previously presented) The method of Claim 24, wherein the items are words.

29. (original) The method of Claim 24, wherein the listener is a plurality of people capable of listening.

30. (canceled)

31. (canceled)

32. (previously presented) The method of Claim 24, further comprising determining an error count by comparing the text of the items with the transcription of what the listener repeats.

33. (original) The method of Claim 32, wherein the error count is determined by evaluating factors selected from the group consisting of word insertions, word deletions, and word substitutions.

34. (original) The method of Claim 24, wherein the intelligibility score is determined by evaluating factors selected from the group consisting of error count, difficulty of items, and ability of the listener.

35. (original) The method of Claim 24, wherein Item Response Theory is used to determine the intelligibility score.

36. (previously presented) An automated intelligibility measurement system, comprising in combination:

- a speaker that provides a response by speaking items;
- a human listener that provides a spoken repetition of what the listener heard when listening to the speaker speaking the items, wherein the listener does not know a text of the items the speaker spoke prior to hearing the speaker speaking the items;
- an automatic speech recognition transcription program operable to create a transcription of the repetition;
- a database that contains speaker responses, the text of the items, and transcriptions of the listener repetitions; and
- a nonlinear model operable to provide an intelligibility estimate of the speaker's intelligibility by automatically comparing the text of the items and the transcriptions contained in the database.

37. (original) The system of Claim 36, wherein the speaker is at least one person whose intelligibility is to be measured.

38. (original) The system of Claim 36, wherein the database contains data from previous intelligibility evaluations.

39. (canceled)

40. (original) The system of Claim 36, wherein the nonlinear model is a neural network.

41. (previously presented) The system of Claim 10, wherein the intelligibility score is an objective measurement of the speaker's intelligibility.

42. (previously presented) The system of Claim 11, wherein the intelligibility score is an objective measurement of the speaker's intelligibility.

43. (previously presented) The system of Claim 21, wherein the intelligibility score is an objective measurement of the speaker's intelligibility.

44. (previously presented) The method of Claim 24, wherein the intelligibility score is an objective measurement of the speaker's intelligibility.

45. (previously presented) An intelligibility measurement system, comprising in combination:

- a human listener that repeats aloud what is heard when listening to a speaker who is speaking items, wherein the listener does not know a text of the items the speaker spoke prior to hearing the speaker speaking the items;
- an automatic speech recognition transcription program operable to create a transcription of what the listener repeats;
- a means for automatically comparing the text of the items with the transcription; and
- a means for measuring intelligibility coupled to the comparing means.

EVIDENCE APPENDIX

None.

RELATED PROCEEDINGS APPENDIX

None.